

2/2 031

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0125592

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MECHANISMS AND KINETICS OF  
POLYMER CRYSTALS GROWTH ARE DISCUSSED WITH 132 REFS. THE USE OF A  
DIGITAL COMPUTER IS DESCRIBED IN MATH, MODELING OF THE POLYMER CHAIN AND  
CRYSTAL GROWTH. FACILITY: INST. KRISTALLOGR., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 548.52

GIVARGIZOV, YE. I., CHERNOV, A. A., Crystallography Institute of the USSR Academy of Sciences

"Growth Rate of Filamentary Crystals by the Vapor-Liquid-Crystal Mechanism and the Role of Surface Energy"

Moscow, Kristallografiya, Vol 18, No 1, 1973, pp 147-153

Abstract: Experiments were performed with respect to the growth of Si, Ge and GaAs whiskers on a monocrystalline substrate inoculated with Au particles as the liquid forming admixture (the vapor-liquid-crystal growth mechanism). The limiting stage of the process is qualitatively established: the phenomena at the liquid-crystal interface turned out to be decisive. A quantitative study was made of the growth rate of Si-crystals as a function of their diameter. There is a critical diameter ( $d_k$ ) below which (for the given supersaturation in the gas phase) the crystals do not grow. The kinetic crystallization coefficient was  $\sim 3.7 \cdot 10^{-4}$  cm-sec<sup>-1</sup>, and the effective supersaturations in the gas phase were from  $2.9 \cdot 10^{-2}$  to  $12.2 \cdot 10^{-2}$  which corresponds to critical diameters from 0.22 to 0.05 microns. The existence of a critical diameter was found to be caused by the Gibbs-Thomson effect.

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USSR

UDC 548.736.6

CHERNOV, A. N., MAKSEMOV, B. A., ILYUKHIN, V. V., Academician  
BELOV, N. V.

"Crystalline Structure of a Monoclinic Modification of K,Zr Di-orthosilicate =  $K_2ZrSi_2O_7$ "

Moscow, Doklady Akademii Nauk SSSR, Vol 193, No 6, 1970, pp 1293-1296

Abstract: Crystals of this type were obtained in the examination of the  $K_2O-ZrO_2-SiO_2$  system by V. G. Chukhlantsev and Yu. M. Poleshayev of the Ural Polytechnical Institute imeni S. M. Kirov. In a cell of the crystal having the periods  $a = 9.54$  and  $b = 11.26$  (with an even pseudo-period of  $b' = b/2$ )  $c = 5.60$ ,  $\gamma = 116^\circ 31'$ ,  $Z = 4$  units. The Fedorov group  $C_{2h} = P2_1/b$  is determined by quenching. Analysis of the three-dimensional Patterson function  $P(uvw)$  detected heavy atoms of Zr and medium atoms of Si and K, the coordinates of the last two being taken as the starting points in the synthesis of the electron density  $\rho(x,y,z)$ . Two tables are supplied in the article, the first giving final values of the basic atom coordinates, the second giving the interatomic distances computed from the data of the first. Also presented are two sketches of the  $K_2ZrSi_2O_7$

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USSR

CHERNOV, A. N., et al, Doklady Akademii Nauk SSSR, Vol 193, No 6, 1970, pp 1293-1296

structure in the xy and yz projections and a sketch of the  $\text{Na}_2\text{ZrSi}_2\text{O}_7$  structure in the xy projection. The authors note that it is worthwhile to make a comparison of the two structures of  $\text{K}_2\text{ZrSi}_2\text{O}_7$  and  $\text{Na}_2\text{ZrSi}_2\text{O}_7$  with that of  $\text{Na}_2\text{Sc/Si}_2\text{O}_7$ , where the 4-valent Zr is replaced by the almost identical ion radius of the 3-valent scandium.

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1/2 013 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--AERATED CONCRETE PRODUCTS -U-  
AUTHOR--CHERNOV, A.N. C  
COUNTRY OF INFO--USSR  
SOURCE--USSR 263,457  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. GBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--04FEB70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--PATENT, CONCRETE, POROSITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3002/1476 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0128875  
UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AA0128875

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. AERATED CONCRETE PRODUCTS ARE OBTAINED BY PREPG. AN AERATED CONCRETE MIX, POURING IT INTO A FORM, LETTING IT SET, AND APPLYING HEAT. HYGROSCOPIC MATERIAL SATD. WITH A SOLN. OF PASSIVATOR OXIDIZING AGENT, SUCH AS CHROMATES, DICHROMATES, OR PERMANGANATES, IS PLACED ON THE BOTTOM OF THE FORM BEFORE THE CONCRETE MIX IS POURED IN SO AS TO OBTAIN PRODUCTS OF VARIABLE D. FACILITY: URAL SCIENTIFIC RESEARCH AND PLANNING INSTITUTE FOR CONSTRUCTION MATERIALS, CHELYABINSK.

UNCLASSIFIED

1/2 011 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--PHASE DIAGRAM OF AS SUB2 X SUB3 AND ASI SUB3 (X IS SULFUR,  
SELENIUM) -U-  
AUTHOR--(03)-CHERNOV, A.P., DEMBOVSKIY, S.A., KIRILENKO, I.A.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(2), 262-5  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS, CHEMISTRY  
TOPIC TAGS--PHASE DIAGRAM, PHYSICAL CHEMISTRY PROPERTY, EUTECTIC MIXTURE,  
SELENIUM COMPOUND, ARSENATE, IODIDE, SULFIDE  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1988/0560 STEP NO--UR/0363/70/006/002/0262/0265  
CIRC ACCESSION NO--AP0105545  
UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0105545

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING PHYS. CHEM. ANAL. METHODS, THE PHASE DIAGRAMS OF THESE SYSTEMS WERE PLOTTED. IN BOTH SYSTEMS, THE EXISTENCE OF THE CHEM. COMPD. OF COMPN. ASXI WAS CONFIRMED. THE EUTECTIC NATURE OF REACTION IN THE INDIVIDUAL AS SUB2 X SUB3NEGATIVE ASXI AND ASXI-ASI SUB3 SYSTEMS WAS ESTABLISHED; THERE IS A LIQ. PHASE SEPN. REGION IN THE AS SUB2 SE SUB3NEGATIVE ASI SUB3 SYSTEM.

UNCLASSIFIED



1/2 011 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--PHASE DIAGRAM OF AS SUB2 X SUB3 AND ASI SUB3 (X IS SULFUR,  
SELENIUM) -U-  
AUTHOR-(03)-~~CHERNOV, A.P.~~, DEMBOVSKIY, S.A., KIRILENKO, I.A.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(2), 262-5  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS, CHEMISTRY  
  
TOPIC TAGS--PHASE DIAGRAM, PHYSICAL CHEMISTRY PROPERTY, EUTECTIC MIXTURE,  
SELENIUM COMPOUND, ARSENATE, IODIDE, SULFIDE  
  
CONTROL MARKING--NO RESTRICTIONS  
  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FAME--1968/0560 STEP NO--UR/0363/70/006/002/0262/0265  
CIRC ACCESSION NO--AP0105545  
UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0105545

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING PHYS. CHEM. ANAL. METHODS, THE PHASE DIAGRAMS OF THESE SYSTEMS WERE PLOTTED. IN BOTH SYSTEMS, THE EXISTENCE OF THE CHEM. COMPD. OF COMPN. ASXI WAS CONFIRMED. THE EUTECTIC NATURE OF REACTION IN THE INDIVIDUAL AS SUB2 X SUB3NEGATIVE ASXI AND ASXI-ASI SUB3 SYSTEMS WAS ESTABLISHED; THERE IS A LIQ. PHASE SEPN. REGION IN THE AS SUB2 SE SUB3NEGATIVE ASI SUB3 SYSTEM.

UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--300CT70

CIRC ACCESSION NO--AP0125769

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VISCOSITY OF GLASSES IN THE AS SUB2 X SUB3 ASI SUB3 (WHERE X EQUALS S, SE) SYSTEMS WAS INVESTIGATED. ANAL. OF THE ACTIVATION PARAMETERS OF THE VISCOSITY MADE IT POSSIBLE TO FORMULATE A CONCLUSION AS TO THE STRUCTURE OF THE GLASS AND TO SHOW THE INTERRELATION BETWEEN THE STRUCTURE AND THE PREVIOUSLY STUDIED PHASE DIAGRAMS. THE PREVIOUSLY USED TECHNIQUES WERE USED FOR THE SYNTHESIS OF THE COMPOS. AND FOR THE VISCOSITY MEASUREMENTS. THE VISCOSITY BEHAVIOR FOR GLASSES OF BOTH SYSTEMS IS SIMILAR. THE INTERACTION BETWEEN AS SUB2 X SUB3 AND ASX1 HAS A EUTECTIC CHARACTER, WITH THE COMPS. OF THE EUTECTICS BEING SIMILAR TO 35 AND 45 MOLE PERCENT ASI SUB3, RESP. THE SOFTENING TEMP. VALUES FOR THE GLASSES STUDIED, AS OBTAINED FROM THE THERMAL ANAL. DATA, ARE PRESENTED. THE BASIC INFORMATION CONCERNING THE STRUCTURE OF THE GLASSES STUDIED IS GIVEN BY THE ANAL. OF THE ACTIVATION ENTROPY OF VISCOUS FLOW IN THE SOFTENING TEMPS. REGION. THE RESP. CURVES ARE SIMILAR FOR BOTH SYSTEMS STUDIED. IN BOTH SYSTEMS A SHARP MAX. CORRESPONDS TO THE COMPN. OF THE COMPD. ASX1. IT IS OBVIOUS THAT THESE COMPOS., WHICH EXIST IN THE CRYST. STATE, DET. ALSO THE STRUCTURE OF THE GLASS. FACILITY: INST. OBSHCH. NEORG. KHIM. IM. KURNAKOVA, MOSCOW, USSR.

UNCLASSIFIED

Acc. Nr: **AP0038056**

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy  
Fiziki, 1970, Vol 58, Nr 1, pp 354-359

SELF-INDUCED TRANSPARENCY OF A GAS  
IN A MAGNETIC FIELD

A. I. Alekseyev, A. S. Chernov

Self-induced transparency of a gas in a magnetic field during traversal by a linearly polarized light pulse is investigated. It is shown that the external magnetic field considerably decreases the number of resonance atomic transitions for which self-induced transparency of the medium is possible. An analytic solution for a linearly polarized light pulse propagating without change of its shape or loss of energy is found in the case of atomic transitions involving a change of the total momentum  $1 \rightarrow 0$ ,  $1/2 \rightarrow 1/2$  and  $1 \rightarrow 1$ . In the presence of self-induced transparency the direction of rotation of light pulse polarization is opposite that of Faraday rotation in a monochromatic wave.

REEL/FRAME  
**19731100**

21

08

USSR

UDC: 531.38

ISHTULOV, A. G., KOVALENKO, V. M., KOSORYGIN, V. S., ~~CHERNOV, A. T.,~~  
and SHUMSKIY, V. V.

"Aerodynamic Characteristics of Long Bodies of Revolution in the  
0.2-6.0 Mach Number Range"

Novosibirsk, Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSSR--  
Seriya Tekhnicheskikh Nauk, No 3, 1972, pp 16-22

Abstract: The authors assert that they know of no earlier work in the experimental confirmation of results derived from the aerodynamic theory of long bodies of revolution. The fundamental point of interest in the experiments described in this paper is the effect of the body's extended length on the nature of the variation in the lift force factor and on the magnitude of the pressure center coefficient. In general, the method of the experiments was to use models of moderate length and extrapolate the results to much longer bodies. Eight such models were used, varying in the shape of the nose part and in the length of the cylindrical shaft. Drawings and scale photographs of the nose portions are shown, and a table of test results for Mach numbers of 0.2-6.0 is reproduced. Members of the Institute of Theoretical and Applied Mechanics in Novosibirsk, the authors conclude with the note that the question  
1/2

USSR

UDC: 531.38

ISHTULOV, A. G., et al, Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSSR--Seriya Tekhnicheskikh Nauk, No 3, 1972, pp 16-22

of the existence of eddies for small attack angles of such bodies requires further research.

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USSR

UDC 669.187.2.083.4:621.365.2

CHERNOV, B. G., CHAN KHOA, and AGEYEV, P. Ya., Leningrad Polytechnic Institute  
imeni M. I. Kalinin

"Study of Processes of Removing Admixtures From Non-Ferrous Nickel Metals  
During Vacuum Smelting"

Moscow, Stal', No 4, Apr 73, pp 327-329

Abstract: An experimental investigation was made in 1-Kg laboratory vacuum furnaces with induction heating and resistance heating, of the behavior of Pb, Bi, Sb, Cu, and Sn admixtures in Ni at temperatures in the 1500-1700°C interval and at a residual pressure of 10 mm Hg. The kinetic variation curves of the admixture content are practically linear, indicating that the process of removing admixtures from the melts follows the first Fick law. At temperatures where the process of vaporization of particles from the surface of the bath dominates over the diffusion through the thoroughly mixed surface layer of the liquid, the application of induction furnaces is recommended because the melt is intermixed more intensively than in electric resistance furnaces. Two figures, one table, two bibliographic references.

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Foundry

USSR

UDC: 669.046.55.001

CHERNOV, B. G., Leningrad

"Vaporization of Certain Impurities of Nonferrous Metals From the Melt in a Vacuum Induction Furnace as a Function of the Content of Alloying Elements in It"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, no 6, Nov-Dec 70, pp 41-46

Abstract: Earlier research has shown that the state of the surface of a melt in a vacuum induction furnace has a marked effect on mass transfer processes between the metal and the gas phase. In some instances this influence is so substantial that the metal vaporization rate (in the presence of an oxide film) drops by several orders. An attempt is described here to determine the nature of removal of some impurities of nonferrous metals from Ni-Al, Ni-Ti, Ni-Cr, and Fe-Al melts in an OKB-497 vacuum induction furnace (1.5 kg capacity for steel) and, depending on the results, to propose a proper procedure for addition of alloying elements into the furnace in the process of melting. Estimates of impurity atom vaporization energies from the surface of Ni-Al, Ni-Ti, Ni-Cr, and Fe-Al alloys are cited in the original article in tabular form.

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Foundry

USSR

UDC: 669.083.4.054

CHERNOV, B. G., FOMIN, N. V., and AGEYEV, P. Ya., Leningrad Polytechnic Institute

"Removal of Impurities of Nonferrous Metals From Melts in the Process of Vacuum Melting"

Moscow, Izvestiya Vyssikh Uchebnykh Zavedeniy - Chernaya Metallurgiya, No 8, 70, pp 23-24

Abstract: An attempt is described to reveal the factors controlling the removal rate of nonferrous metal impurities from iron and nickel-base melts in vacuum induction-type furnaces at a vacuum of 0.001--0.0001 mm Hg. The refining of the melt from nonferrous metals impurities, which is based on evaporation, comprises several stages: 1) convective transfer of impurities from the bulk of the melt toward the surface diffusion layer; 2) diffusion through this layer; 3) particle vaporization from the melt's surface, and 4) diffusion of evaporating particles in the melting chamber of the furnace. In a vacuum-type high-frequency induction furnace the forced agitation rate at 1600--1700°C attains 10--30 cm/sec. The problem posed here is reduced to studying the elementary acts of impurity transfer through the unmixed diffusion layer and the impurity evaporation from the surface. It is shown that the removal rate of nonferrous metal impurities is controlled by their vaporization intensity. A logarithmic formula has been derived describing the relation between the initial and current concentration of impurities in the melt and its holding time under vacuum.

USSR

UDC: 518.5:681.3.06

ZAPLETIN, P. P., CHERNOV, O. A.

"A Program for 'Nairi' Computer Realization of Selection of the Optimum Size of Industrial Enterprises"

Tr. Seminara po teorii ustoychivosti dvizheniya. Kazakhsk. gos. ped. in-t  
(Works of the Seminar on Motion Stability Theory. Kazakh State Pedagogical Institute), 1970, vyp. 3, pp 77-80 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V776)

[No abstract]

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1/2 023 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--SOLDER FOR SOLDERING ELECTRONIC EQUIPMENT -U-  
AUTHOR--(05)-TUTORSKAYA, N.N., KROLEVA, S.P., YUSHKINA, YE.T., PODVIGINA,  
O.P., CHERNOV, O.V.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 264,139  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRATZSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--10FEB70  
SUBJECT AREAS--MATERIALS, ELECTRONICS AND ELECTRICAL ENGR.  
TOPIC TAGS--CHEMICAL PATENT, ELECTRONIC EQUIPMENT, SOLDER, CHEMICAL  
COMPOSITION, COPPER, NICKEL, GERMANIUM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3004/1829 STEP NO--UR/0462/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0132094  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AA0132094

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE SOLDER, BASED ON CU,  
ALSO CONTAINS GE 1-5 AND NI 1-3PERCENT.

UNCLASSIFIED

1/2 027 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--TITANIUM DISILICIDE PREPARATION -U-  
AUTHOR-(03)-DELIMARSKIY, YU.K., CHERNOV, R.V., NIZOV, A.P.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 264,696  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970, 47(9)  
DATE PUBLISHED--03MAR70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL PATENT, ELECTROLYSIS, INERT GAS, TITANIUM COMPOUND,  
SILICIDE, FLUORIDE, ALKALI METAL, HALIDE, ARGON  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3001/1467 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0126998  
UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AA0126998

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TI DISILICIDE IS PREPD. BY  
ELECTROLYSIS IN AN INERT GAS, E.G. AR, ATM. IN AN ELECTROLYTE CONTG.  
ALKALI METAL HALIDES AND HAVING THE FOLLOWING COMPN. (IN WT. PERCENT):  
NACL,KCL (1:1) 55-7, ALKALI METAL FLUOROSILICATE 30-8, AND A TI,CONTG.  
COMPD., E.G. TIO SUB2 OR NA SUB2 TIF SUB6, 5-10. FACILITY:  
INSTITUT OBSHCHEYI NEORGANICHESKOY KHIMII AN UKRAINSKOY SSR.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--11DEC70  
TITLE--SINTERING OF A SILICON TITANIUM CONCENTRATE FROM THE YAREGA DEPOSIT  
WITH SODIUM FLUOROSILICATE -U-  
AUTHOR--(03)-DELMARSKIY, YU.K., CHERNOV, R.V., KOVZUN, I.G.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43 (5), 1008-15

DATE PUBLISHED-----70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, MATERIALS

TOPIC TAGS--MELTING POINT, CHEMICAL COMPOSITION, SILICON, TITANIUM,  
MINERAL DEPOSIT, GEOGRAPHIC LOCATION, SILICATE, FLUORIDE, SINTERING  
FURNACE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REL/FRAME--3004/0957

STEP NO--UR/0080/70/043/005/1008/1015

CIRC ACCESSION NO--AP0131542

UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0131542

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF THE PARTICLE SIZE DISTRIBUTION OF THE CONC., THE TEMP., THE CHEM. COMPN. OF THE STARTING MIXT., AND THE PRESSURE OF THE GASEOUS SIF SUB4 ON THE SINTERING PROCESS WERE STUDIED. THE EQUIL. PRESSURE OF SIF SUB4 OVER A MIXT. OF THE CONC. AND NA SUB2 SIF SUB6 INCREASES SHARPLY AS COMPARED TO THE PRESSURE OVER PURE NA SUB2 SIF SUB6 AT EQUAL TEMP. INTRODUCTION OF SUBSTANCES INTO THE REACTION MIXT. WHICH DECREASE THE M.P. EXERTS A POS. EFFECT ON THE DEGREE OF INTERACTION OF THE COMPONENTS. FACILITY: INST. OBSHCH. NEORG. KHIM., KIEV; USSR.

UNCLASSIFIED



1/3 018 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--THALLIUM ACTIVATED POTASSIUM CHLORIDE CATHODOLUMINESCENCE -U-  
AUTHOR-(03)-LURYE, A.M., ALUKERS, E., CHERNOV, S.A.  
COUNTRY OF INFO--USSR  
SOURCE--LATV. PSR ZINAT. AKAD. VESTIS, FIZ. TEH. ZINAT. SER. 1970, (1),  
84-7  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS  
  
TOPIC TAGS--POTASSIUM CHLORIDE, THALLIUM, CATHODOLUMINESCENCE,  
LUMINESCENCE SPECTRUM, QUANTUM YIELD, TEMPERATURE DEPENDENCE  
  
CONTROL MARKING--NO RESTRICTIONS  
  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1996/1531 STEP NO--UR/0371/70/000/001/0084/0087  
CIRC ACCESSION NO--AP0118518  
UNCLASSIFIED

2/3 018

UNCLASSIFIED

CIRC ACCESSION NO--AP0118518

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE INVESTIGATION WAS DONE BY A TECHNIQUE SIMILAR TO THAT USED EARLIER FOR CSI-TL (CA 69: 71752G). THE AIM WAS TO GENERALIZE THE EXISTING KNOWLEDGE OF THE PROBLEM CONCERNED AND TO DEFINE ITS APPLICABILITY TO OTHER PHOSPHORS OF THE ALKALI METAL HALIDE TYPE. THE KCL-TL SAMPLE CRYSTAL USED CONTAINED THE ACTIVATOR IN AN AMT. OF 0.1 MOLE PERCENT (AS DETD. POLAROGRAPHICALLY). THE CATHODOLUMINESCENCE SPECTRA (INVESTIGATED AT 100-400DEGREESK) SHOWED 2 NONELEMENTARY BANDS: (1) AN UV BAND WITH A MAX. AT 310 NM CONSISTING OF A BAND AT 310 NM (ASCRIBED TO THE PRIME3 P SUB1 PRIME1 S SUBO TRANSITION IN ACTIVATOR IONS) AND A BAND AT 365 NM (DUE EVIDENTLY ALSO TO TL) AND (2) A VISIBLE REGION BAND HAVING ITS MAX. AT 500 NM CONSISTING AT LEAST OF A BAND AT 410 NM (DUE TO RECOMBINATION OF HOLES ON THE TL PRIMEO CENTERS) AND A BAND AT 470 NM (INVOLVING PARTICIPATION OF COMPLEX TL CENTERS). THE 310 NM LUMINESCENCE YIELD (ETA SUB310) EXCITATION INTENSITY (E) DEPENDENCE (STUDIED AT 100-550DEGREESK) CORRESPONDED TO THAT OBSD. FOR CSI-TL: AT DEFINITE TEMP. CONDITIONS, ETA SUB310 ROSE WITH INCREASING E AT COMPARATIVELY LOW E VALUES AND DROPPED IN 2 STAGES AT HIGHER E VALUES (THE ETA SUB310 RISE DISAPPEARED AT TEMPS. BELOW THE EXTERNAL QUENCHING REGION, THE 1ST STAGE OF ETA SUB310 DROP WAS ABSENT AT TEMPS. AT WHICH THE TL PRIMEO CENTERS ARE STABLE, AND AT 100DEGREESK ETA SUB310 WAS CONST. FOR ALL THE E VALUES STUDIED. THE 410 NM GLOW YIELD (ETA SUB310) E DEPENDENCE TAKEN AT 450DEGREESK CONFRONTED WITH THE ETA SUB310 E DEPENDENCE SHOWED THAT ETA SUB410 DROPPED IN AN E RANGE EQUAL APPROX. TO THAT IN WHICH ETA310 WAS RISING.

UNCLASSIFIED

3/3 018

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118518

ABSTRACT/EXTRACT--AT 550DEGREESK, THE 2ND STAGE OF ETA SUB310 DROP WAS  
ACCOMPANIED BY A DROP OF ETA SUB410. AT 1000DEGREESK, ETA SUB410 DID NOT  
DEPEND ON E (SIMILARLY AS WAS THE CASE WITH ETA SUB310). THE RESULTS  
ARE DISCUSSED IN TERMS OF CONSIDERATIONS INVOLVING COMPETITION OF  
VARIOUS TRAPPING CENTERS. FACILITY: INST. FIZ., RIGA, USSR.

UNCLASSIFIED

USSR

UDC 621.371.029.55 10

BENEDIKTOV, Ye. A., GETMANTSEV, G. G., YEBZHOV, A. I., KOROBKOV, ~~Yu.~~ S., MALYSHEV, S. K., MATYUGIN, S. N., MITYAKOV, N. A., SAZONOV, Yu. A., CHERNOV, V. A., BEN'KOVA, N. P., BEREZIN, Yu. M., BUKIN, G. V., KOLOKOLOV, L. Ye., and PEREKHVATOV, Yu. K.

"Results of an Experiment in Shortwave Radio Propagation"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. Sekts. 3. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses; Section 3--collection of works) "Nauka," 1972 pp 73-76 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10A367)

Translation: Results of experiments on investigating the characteristics of wave propagation in the decameter range (5.7-15.0 MHz) are analyzed; the communications took place between the following magnetically adjacent points: an ionospheric station in Gor'kiy and two science research ships in the Indian Ocean. In particular, the possibility of communication over the Peterson beam was estimated. Two illustrations, bibliography of one. H. S.

1/1

1/2 024 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--DISTRIBUTION AND EXCRETION FROM MICE (INTACT AND WITH  
TRANSPLANTABLE TUMORS) OF C PRIME14 AURANTIN -U-  
AUTHOR-(05)-SUSKOVA, V.S., KHASIGOV, P.Z., CHERNOV, V.A., KARPOV, V.L.,  
SEREBRYAKOV, N.G.  
COUNTRY OF INFO--USSR  
SOURCE--ANTIBIOTIKI, 1970, VOL 15, NR 5, PP 437-441  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--HOUSE, TISSUE TRANSPLANT, TUMOR, SARCOMA, LYMPHATIC SYSTEM,  
LIVER, KIDNEY, LUNGS, SPLEEN, SMALL INTESTINE, RADIOACTIVE TRACER,  
THYMUS GLAND, AUTINEOPLASTIC DRUG, CARBON ISOTOPE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1994/1141 STEP NO--UR/0297/70/015/005/0437/0441  
CIRC ACCESSION NO--AP0115160  
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0115160

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISTRIBUTION OF C PRIME14 AURANTIN IN MICE INTACT AND WITH TRANSPLANTABLE LYMPHOLEUCOSIS NK-LY AND LYMPHOSARCOMA LIO 1, AND ITS EXCRETION AFTER SINGLE INTRAVENOUS OR SUBCUTANEOUS ADMINISTRATIONS WERE STUDIED. THE DISTRIBUTION OF THE DRUG WAS NOT REGULAR. RADIOACTIVITY IN THE LIVER, KIDNEYS, LUNGS AND SPLEEN REGISTERED IN 30 TO 60 MINUTES AFTER THE DRUG ADMINISTRATION WAS REDISTRIBUTED IN 6 HOURS AFTER INTRAVENOUS ADMINISTRATION AND IN 18-24 HOURS AFTER SUBCUTANEOUS ADMINISTRATION WITH AN INCREASE IN ITS LEVELS IN THE SPLEEN, THIN INTESTINE, THYMUS. MAXIMUM ACTIVITY IN TUMORS WAS OBSERVED BY THE END OF 24 HOURS, THE LEVEL IN NK-LY BEING HIGHER THAN IN LIO 1. AFTER INTRAVENOUS ADMINISTRATION THE ORGANS WERE MAINLY FREE FROM ACTIVITY BY THAT TIME, WHILE AFTER SUBCUTANEOUS ADMINISTRATION THE ORGANS WERE MAINLY FREE FROM ACTIVITY BY THE END OF THE 2ND DAY AND LATER. AFTER SUBCUTANEOUS ADMINISTRATION OF C PRIME14 AURANTIN FOR 3 TIMES AT AN INTERVAL OF 48 HOURS NO ACCUMULATION OF THE DRUG IN THE ORGANS AND TISSUES, INCLUDING TUMORS WAS OBSERVED. THE RESULTS OBTAINED ARE DISCUSSED. FACILITY: INSTITUTE OF MEDICAL RADIOLOGY OF ACADEMY OF MEDICAL SCIENCES OF THE USSR, OBNINSK.

UNCLASSIFIED

USSR

UDC: 621.317.71:621.791.03

VINOGRADOV, G. V., IGNATKIN, Yu. N., and CHERNOV, V. D.

"Instrument for Measuring the Welding Current Amplitude in Low-Power Contact Machines"

Elektron. tekhnika. Nauch.-tekhn. sb. Tekhnol., organiz., proiz-va i oborud. (Electronics Engineering; Scientific-Technical Collection; Technology, Organization of Production, and Equipment) No 3(51), 1972, pp 41-43 (from RZh--Avtomatika, telemekhanika i vychislitel'naya tekhnika, No 2, 1973, Abstract No 2A351)

Translation: A device is described for measuring pulse current amplitudes in welding small parts on a welding automaton of an automatic line for producing resistors of the VS type. Two illustrations, bibliography of one. Resume

1/1

USSR

UDC 51:155.001.57:612.82

ZOZULYA, Yu. I., CHERNOV, V. G., BUGAY, Yu. P.

"Mathematical Models of Detectors in the Frog Retina"

Probl. Bioniki. Resp. Mezhd. Nauchno-tekhn. Sb. [Problems of Bionics, Republic Interdepartmental Scientific and Technical Collection], No 4, 1970, pp 16-22, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V675 by the authors).

Translation: The construction and analysis of a statistical model of the detector for long-term contrast (contour detector) are studied.



USSR

UDC: 8.74

CHERNOV, Y. G.

"Use of a Measure of Order for Evaluating the Effectiveness of Sorting Methods"

[Tr.] Mosk. in-ta inzh. zh.-d. transp. ([Works] of the Moscow Institute of Railway Transportation Engineers), 1971, vyp. 391, pp 179-183 (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V1003)

Translation: As a measure of order of a data block, the author uses a quantity defined as follows:  $I = \sum_{i=1}^{n-1} \sum_{j=i+1}^n \beta_{ij}$ , where  $\beta_{ij} = \begin{cases} 1 & \text{when } x_i > x_j \\ 0 & \text{when } x_i \leq x_j \end{cases}$ . A data block is understood to mean the set of objects  $X = \{x_1, x_2, \dots, x_n\}$ , among which an order relation may be established. It is shown that the proposed measure uniquely defines the productivity of a number of methods of sorting, and enables evaluating the effectiveness of algorithmically complex methods of sorting. This possibility is illustrated by the example of the Shell method. V. Mikheyev.

1/1

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CHERNOV, V.I.

Medical

30 Jul 72

96

PD: CYBERNETICS

DUGAL

56. UCHN

UDC 62-50

AYENMAN, M. A. and ANDRIYAN, Ye. A.

"General Very Simple Mechanisms of Skeletal Muscle Control"

Iskolevaniye Professora Upravleniya Kuchevskoy Aktivnost'yu, Moscow, "Nauka" Publishing House, 1970, pp 5-40

Translation (of author's abstract): Model representations of single muscle control systems and control systems for pairs of muscle-antagonists are given for precise maintenance of desired value of a joint angle and also for the movement by specific joints.

1/1

SO: Foreign Press Digest  
30 Jul 71

57. USM

UDC 62-50

ANDRIYAN, Ye. A., ZAMAROVA, E. N., LITVINSEV, A. I. and CHERNOV, V. I.

"Muscle Twitches as Elementary Acts of Muscle Activity"

Iskolevaniye Professora Upravleniya Kuchevskoy Aktivnost'yu, Moscow, "Nauka" Publishing House, 1970, pp 50-60

Translation (of author's abstract): A method of interpreting an EMG [electromyogram] by passing it through a filter is proposed. This technique shows that muscle functioning is accompanied by twitches whose detection in the EMG proves to be difficult. It was experimentally shown that these twitches are registered in the curve of variation of the force generated by the muscle in time intervals of the order of 100 msec.

The method used shows that the central fact in the control of muscle activity is the instants of twitch initiation and that these instants are practically independent of filter characteristics.

The proposed method is convenient for studying muscle control processes.

1/1

*Cybernetics*

30 Jul 71

97

FED: CYBERNETICS

U.S.S.R.

58. USSR

UDC 62-50

ZAKHAROV, L. M. and CHERNYI, V. I.

"Relationship between Electrical Activity of Nerves and Muscle Strengthening in Isometric Conditions"

Izvestiya Professorov Upravleniya Fizicheskoy Aktivnost'yu, Moscow, "Znaniya" Publishing House, 1970, pp 62-65

Translation (of author's abstract): Results of experiments on animals and man studying the relationship between total electrical activity of a muscle and its strengthening in the isometric case are described.

It is shown that the signal received from the muscle EMG by passing it through a detector, through an inertial link with a time constant of 0.25 sec, and with a time lag of 0.02 sec is found to show quite good agreement with the variation in muscle strength in the frequency range from fractions of 1 hertz to 10 hertz.

1/2

SO: Foreign Press Digest

30 Jul 71

59. USSR

UDC 62-50

ANDREYEV, N. A., ZEMALINOV, N. A., and CHERNYI, V. I.

"Relationship between Joint Torque and Control of Joint Angle"

Izvestiya Professorov Upravleniya Fizicheskoy Aktivnost'yu, Moscow, "Znaniya" Publishing House, 1970, pp 66-73

Translation (of author's abstract): Results of an experimental study of the activity of a pair of muscle-antagonists in the maintenance of a given joint angle under different conditions are given.

The 10-hertz component of the joint angle torque is shown to result from the functioning of the almost instant control mechanism and the 100-hertz component is a consequence of random extraneous influences on the operation of this mechanism.

1/2

CHERNYI, V. I.

USSR

UDC 616.12-007-053.1-089.5-06

SERGIYEVSKIY, V. S., TASHPULATOV, A. T., CHERNOV, V. K., NUGMANOV, YE. K., YAVORSKAYA, G. V., ERENBURG, T. A., LIZUNKOVA, L. P., and TSYBANEVA, N. G., Department of Cardiovascular Surgery, Kazakh Institute of Clinical and Experimental Surgery, Ministry of Public Health, Kazakh SSR, Alma-Ata

"Operative Complications During Correction of Congenital Heart Defects Under Conditions of Moderate Hypothermia"

Moscow , Grudnaya Khirurgiya, No 2, 1970, pp 57-62

Abstract: A total of 230 operations were performed using hypothermia at the institute from 1965 to 1969, operations were conducted to correct septal defects, pulmonary and aortic stenosis, tetralogy of Fallot, combined and rare defects. Among the life-threatening complications encountered in the operations were asystole, ventricular fibrillation, aeroembolism of the coronary vessels, loss of blood, atrioventricular and bundle-branch heart block. The causes of the complications are analyzed and suggestions made to prevent them and to control those that occur. With the present level of knowledge, mortality during operations performed under moderate hypothermia should not exceed 1%.

1/1

- END -

7676

USSR

UDC 539.67

CHERNOV, V. M., and INDENBOM, V. L.


"Overcoming Point Defects by Elastic Field Dislocation as an Internal Friction Mechanism"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction in Metallic Materials), Moscow, Izd-vo, "Nauka", 1970 pp 26-32

Abstract: A dislocation theory of the hysteresis internal friction which takes into account the latest achievements in the theory of strengthening by addition and radiation is developed. Nonactivated and thermally activated dislocation breakaway from points of strengthening was considered under rigorous formulation. The form and energy of the dislocation segment overcoming the point defects field are determined, and basic characteristics of dislocation hysteresis are formulated. 4 figures, 9 references.

1/1

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1/2 018 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--ALLOYING A MAGNICO ALLOY WITH NEODYMIUM -U-  
AUTHOR--LARINA, L.S., CHERNOV, V.M.   
COUNTRY OF INFO--USSR  
SOURCE--LITEINOE PROIZVOD. 1970, (1), 31-2  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--NEODYMIUM CONTAINING ALLOY, MAGNETIC ALLOY, MAGNETIC PROPERTY,  
INDUCTION FURNACE, IRON BASE ALLOY, COBALT CONTAINING ALLOY,  
THERMOMAGNETIC EFFECT, ALLOY DESIGNATION, METAL MELTING/(U)MAGNICO  
MAGNETIC ALLOY  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1988/1320 STEP NO--UR/0128/70/000/001/0031/0032  
CIRC ACCESSION NO--AP0106097  
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106097

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IMPROVEMENT OF MAGNETIC CHARACTERISTICS OF MAGNICO ALLOYS WAS STUDIED BY ALLOYING THEM WITH ND. THE ALLOY (CO 23, NI 13.5, AL 8.5, CU 3, S 0.2, AND TI 0.3 WT. PERCENT, FE REST) WAS MELTED IN A 10 KG CAPACITY HIGH FREQUENCY INDUCTION FURNACE WITH AN ACID LINING. ND, (1, 2, 5, 50, 100, AND 500) TIMES 10 PRIME NEGATIVE3 PERCENT, WRIPPED IN AN AL FOIL WAS IMMERSSED IN THE MOLTEN ALLOY. THE ALLOY WAS MIXED AND POURED INTO 16 TIMES 16 TIMES 50 MM MOLDS. CONVENTIONAL THERMO MAGNETIC TREATMENT FOLLOWED. OPTIMUM TEMPERING CONDITIONS WERE DETD. BY HEATING AT 2 HR INTERVALS UP TO 8 HR AT 550 AND 600DEGREES AND FOR 1 HR INTERVALS UP TO 4 HR AT 650DEGREES THE OPTIMUM LEVEL OF ND ADDN. WAS 0.005PERCENT. INCREASING ND FROM 0.001 TO 0.05PERCENT INCREASED THE COERCIVE FORCE, HOWEVER, A FURTHER INCREASE UP TO 0.3PERCENT SHARPLY DECREASED THE COERCIVE FORCE. THE MAX. MAGNETIC ENERGY OCCURRED AT 0.005PERCENT ND. RESIDUAL INDUCTION REMAINED UNCHANGED AT 0.001-0.05 ND INCREASING STEADILY WITH LARGER AMTS. THE STRUCTURE OF THE ALLOY WAS DENDRITIC AT ALL CONCNS. THE POLISHING PROPERTIES OF THE ALLOYS WITH ND WERE IMPROVED, SO THAT IN GENERAL THE ND ADDN. WAS ADVANTAGEOUS.

UNCLASSIFIED

USSR

UDC 533.9.08

CHERNOV, V.P., TEAREV, V.A.

"Polarization Of Synthesized Plasma In Exterior Alternating Electrostatic Field"

V sb. Vopr. elektron. tekhniki (Problems Of Electronics Technology--Collection Of Works), Saratov, 1970, pp 120-126 (from RZh--Elektronika i yeye primeneniya, No 6, June 1970, Abstract No 64229)

Translation: In the work relationships are obtained for the current density and field of polarization, not allowing for collisions with neutrals in the synthesized polarized plasma, as well as expressions for the steady-state volume density of the charges of the electrons and ions, taking account of collisions with neutrals.

Summary

1/1



USSR

UDC 621.37.32

TIUNOV, YU. A., and CHERNOV, V. S., Physicotechnical Institute of Low-Temperatures, Academy of Sciences Ukrainian SSR, Khar'kov

"Controlling the Generation Kinetics of Coupled Lasers"

Kiev, Ukrainskiy Fizicheskii Zhurnal, Vol 17, No 4, Apr 72, pp 628-634

Abstract: The article suggests a method for obtaining strictly stationary generation of one of the coupled lasers by means of the second (initiating) laser, which is adjusted so that in the absence of coupling it generates under almost stationary conditions with small oscillations (this can be achieved, for example, by introducing a KS-15 negatively modulating filter into the initiating laser cavity). Theoretical calculations indicate that in order to obtain stationary generation throughout the pump pulse it is sufficient for the coupling coefficient to be of the order of 1 percent. There were two series of experiments, with the first studying the dependence of the generation kinetics on the coupling coefficient  $\gamma$ . Two ruby lasers with a system of two positive lenses were used. It was found that at  $\gamma = 0$  the radiation of the investigated laser represented the regular damped intensity

1/2

USSR

TIUNOV, YU. A., and CHERNOV, V. S., Ukrainskiy Fizicheskiy Zhurnal, Vol 17, No 4, Apr 72, pp 628-634

oscillations typical of the free generation of lasers with a lens system. There is an increase in the rate of damping of intensity peaks with an increase in  $\gamma$ . Finally, at  $\gamma = 1.1$  percent relaxation occurs practically instantaneously, and the generator operates under purely quasistationary conditions. The second series of experiments studied the dependence of the generation kinetics on the pump power.

The authors thank A. M. RATNER and YU. V. NABOYKIN for useful discussion of the results.

2/2

- 13 -

1/2 059 UNCLASSIFIED  
TITLE--KINETICS OF COUPLED LASERS -U-

PROCESSING DATE--20NOV70

AUTHOR--(02)-RATNER, A.M., CHERNOV, V.S.

COUNTRY OF INFO--USSR

SOURCE--UKRAINS'KII FIZICHNII ZHURNAL, VOL. 15, FEB. 1970

DATE PUBLISHED--FEB70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--LASER, LASER POWER OUTPUT, DAMPING MOMENT, KINETIC THEORY,  
OPTIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1460

STEP NO--UR/0185/70/015/000/0331/0333

CIRC ACCESSION NO--AP0112454

UNCLASSIFIED

2/2 059

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0112454

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. THEORETICAL ANALYSIS OF THE KINETIC CHARACTERISTICS OF THE OPERATION OF COUPLED LASERS HAVING MUTUALLY PENETRATING RADIATION PATTERNS PARALLEL TO EACH OTHER'S OPTICAL AXIS. CONDITIONS OF EMISSION POWER DAMPING IN COUPLED LASERS ARE DISCUSSED IN DETAIL. A POWER DAMPING MECHANISM IS PROPOSED. FACILITY: AKADEMIIA NAUK UKRAINS'KOI RSR, FIZIKO TEKHNIICHNII INSTITUT NIZ'KIKH TEMPERATUR, KHARKOV, UKRAINIAN SSR.

UNCLASSIFIED

USSR

UDC 669.71.053.4(038.8)

BAZHENOV, A. YE., GRECHUKHIN, N. V., OSOKINA, V. K., PAL'CHIKOVA, A. I.,  
PAL'CHIKOVA, T. A., TARASOV, I. A., FEDORTSOV, V. D., CHALIK, A. D.,  
CHERNOV, V. Ye

"Method of Obtaining Cryolite"

USSR Author's Certificate No 312834, filed 3 Mar 70, published 15 Oct 71  
(from RZh--Metallurgiya, No 4, Apr 72, Abstract No 4G179P)

Translation: The procedure for obtaining cryolite by roasting the slurry at 700-800° formed as a result of wet removal of the gases in aluminum production is distinguished by the fact that in order to improve the quality of the product, the roasted slurry is subjected to water treatment at 35-40° with a L:S ratio of 5-10: 1 with subsequent leaching out of the precipitate by a 2-10% solution of HF at 55-75° with a L:S ratio of 3-10:1. An example is presented.

1/1

USSR

UDC 621.373.826:772.99

KOTOSONOV, N. V., KHILCHENKO, I. A., ~~CHERNOV, YI. A.~~

"Application of Infrared CO<sub>2</sub> Lasers for Holography and Data Recording"

V sb. Ispol'z. optich. kvant. generatorov v sovrem. tekhn. i med. Ch. 2-3  
(Utilization of Lasers in Modern Engineering and Medicine. Parts 2-3---collection of works), Leningrad, 1971, pp 57-59 (from RZh-Radiotekhnika, No 1, 1972, Abstract No 1D628)

Translation: A study was made of the possibility of using CO<sub>2</sub> lasers for high-speed data recording systems and for holography in the infrared range. It was proposed that thermo-optical structures with the thermal recording procedure be used as the media for recording radiation on a wavelength of 10.6 microns. The devices constitute an absorption receiver the operation of which is based on the dependence of the transparency of the semiconductor material for visible light on a certain wavelength on temperature. The semiconductor material is deposited in the form of a thin layer on a mica substrate which simultaneously serves as the infrared radiation absorber. It was demonstrated that for recording data arriving with a frequency of 1 megahertz, the required laser power for recording 100 micron spots must be ~1 watt. Self-erasure of the recording (~10<sup>-1</sup> seconds) provides for the operativeness of the given system. There is 1 illustration and a 3-entry bibliography.

1/1

Recorders and Transducers

USSR

UDC: 621.385:530.145.6.77

KOTOSONOV, N. V., KHRIPCHENKO, I. A., CHERNOV, Ye. A., SVIRIDOVA, O. A.

"Resolution of Thermoholograms"

V sb. Radiofiz. i mikroelektronika (Radio Physics and Microelectronics--collection of works), Voronezh, 1970, pp 40-46 (from RZh-Radiotekhnika, no 6, Jun 71, Abstract No 6D421)

Translation: The paper deals with recording devices (thermoholograms) on which the exposing irradiation is recorded in the form of a temperature relief which reproduces the distribution of the irradiating flux intensity. The operating principle of the thermogram is based on the transparency of the material as a function of temperature. The device consists of a heat-sensing element (thermoplate) which absorbs the exposing irradiation, and a thin semiconductor film which is in thermal contact with the thermoplate. With a change in temperature, the long-wave edge of the absorption band is displaced. If radiation from an auxiliary transillumination source with a wavelength close to the edge of the absorption band is sent through this layer, the intensity of the emission after passing through the layer will depend on the position of the absorption band, and hence on the tem-

1/2

KOTOSCHOV, N. V. et al., Radiofiz. i mikroelektronika, Voronezh, 1970,  
pp 40-46

perature of the layer. For a semiconductor layer with linear temperature dependence of the displacement, the process of restoration of the wave front from the thermohologram is analogous to restoration from amplitude holograms on photographic emulsions. The resolution of a thermogram is evaluated, and its value is calculated for a device in which the thermoplate is "Muscovite" mica, while the semiconductor plate is a selenium layer vaporized onto the mica substrate. A. K.

2/2

- 147 -



1/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--SENSITIVITY OF SPHERICAL DETECTORS FOR 0.4 EV-10 MEV NEUTRONS -U-  
AUTHOR--(05)-ANDREYEVA, L.S., KEIRIMMARKUS, I.B., USPENSKIY, L.N.,  
FILIYUSHKIN, I.V., CHERNOV, YE.N.  
COUNTRY OF INFO--USSR  
SOURCE--PRIB. TEKH. EKSP. 1970, 1, 72-5  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS  
  
TOPIC TAGS--NEUTRON DETECTOR, THERMAL NEUTRON, POLYETHYLENE, NEUTRON  
SPECTRUM, FAST NEUTRON, VAN DE GRAAFF ACCELERATOR  
  
CONTROL MARKING--NO RESTRICTIONS  
  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FKAME--1991/1072 STEP NO--UR/0120/70/001/000/0072/0075  
  
CIRC ACCESSION NO--AP0110762  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0110762

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPTL. DATA WERE OBTAINED TO DET.  
THE SENSITIVITY OF A THERMAL N DETECTOR WITH SPHERICAL POLYETHYLENE  
MODERATORS (P EQUALS 0.94 G-CM PRIME3) OF DIFFERENT DIMENSIONS  
(4.86-24.1 G-CM PRIME2) IN THE N ENERGY RANGE FROM THERMAL TO 10 MEV.  
THE MEASUREMENTS IN THE LOW ENERGY REGION WERE CONDUCTED IN A PULSATING  
FAST REACTOR ACCORDING TO TIME OF FLIGHT AND IN THE HIGH ENERGY REGION  
IN A VAN DE GRAAFF ACCELERATOR. OPTIMUM DIMENSIONS WERE SELECTED FOR  
THE MODERATORS BASED ON THESE MEASUREMENTS. FACILITY: INST.  
BIOFIZ., MOSCOW, USSR.

UNCLASSIFIED

1/2 009 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--20,000 MILES IN ITS WAKE -U-

AUTHOR--CHERNOV, YU. C

COUNTRY OF INFO--USSR

SOURCE--KRASNAYA ZVEZDA, JULY 19, 1970, P 2, COLS 6-8

DATE PUBLISHED--19JUL70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, MECH., IND., CIVIL AND  
MARINE ENGR

TOPIC TAGS--OCEANOGRAPHIC SHIP, OCEANOGRAPHIC EXPEDITION/(U)PAMYAT  
MERKURIYA SHIP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/0495

STEP NO--02/9008/70/000/000/0002/0002

CIRC ACCESSION NO--AND114749

UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--02JCF70

CIRC ACCESSION NO--AN0114749

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A HYDROGRAPHIC SHIP, THE "PAMYAT  
MERKURIYA", UNDER THE COMMAND OF CAPTAIN A. POSHIN, HAS RETURNED TO ITS  
HOME PORT AFTER A FOUR MONTHS CRUISE IN THE MEDITERRANEAN.

UNCLASSIFIED

89

1/2 015 UNCLASSIFIED <sup>ucl</sup> PROCESSING DATE--30OCT70  
TITLE--AUTOMATIC WELDING OF TEE JOINTS BY A POWDER WIRE -U-  
AUTHOR--(05)-DIKUN, V.N., CHERNOV, YU.A., PELEVICH, YU.P., DUBEN, L.V.,  
SULLOVYEV, G.N.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, SVARGCHNOYE PROIZVODSTVO, NO 3, 1970, P 19  
DATE PUBLISHED--70  
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--AUTOMATIC WELDING, WELD JOINT, WIRE, WELDING  
ELECTRODE/(U)EPS152 POWDER WIRE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1999/1298 STEP NO--UR/0135/70/000/003/0019/0019  
CIRC ACCESSION NO--AP0123257  
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123257

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TECHNOLOGY HAS BEEN DEVELOPED OF A SINGLE PASS AUTOMATIC WELDING OF TEE JOINTS USING A POWDER WIRE, IN WHICH JOINTS WITH A LEG UP TO 8 MM ARE WELDED IN A SINGLE PASS. WITH INCREASE OF THE LEG THE WELDING IS PERFORMED IN SEVERAL PASSES WITH SCRUBBING SLAG FROM JOINTS. THE WORKING CONDITIONS OF THE AUTOMATIC SINGLE PASS WELDING BY THE EPS-15,2 POWDER WIRE OF TEE JOINTS WERE DETERMINED.

UNCLASSIFIED

ionospheric physics

CHERNOV, YU. A.

ionospheric physics

JPRS 54893

10 January 1972

# BACKSCATTER IONOSPHERIC SOUNDING

Complete translation of book by ~~Yu. A. Chernov~~ "Vozvratno-naionnoye zondirovaniye ionosfery". Svyaz Press, Moscow, Russian, 1971, signed to press 21 April 1971, UDC 621.371, 204 pages.

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Chapter 2: Basic Problems of Decoding Backscatter Sounding Oscillograms .....	9
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- a - [1 - USSR - A]

# FOREWORD

In recent years the arsenal of means by which the ionosphere is studied and the operation of short wave radio communications lines is controlled has been supplemented by backscatter sounding. The method of backscatter sounding was discovered at the end of the 1940's when the terrestrial origin of scattered echos was proved both in the Soviet Union and in the United States of America. Since that time many articles have appeared in which various applications of backscatter sounding and certain theoretical problems of this technique are investigated. The monograph by N. I. Kabanov and V. I. Yarov, *Vozrastno-nakladyayemye zondirovaniye ionosfery (Backscatter Ionospheric Sounding)* (Moscow, Soviet Radio Press, 1963) was published in 1965. Primary attention was given to the experimental results in this paper.

The present monograph is basically devoted to the theory of the method of backscatter sounding. This aspect of backscatter sounding is comparatively weakly reflected in the existing publications. In particular, the studies of the effect of magneto-ionic splitting in the ionosphere on the position of the scattered signal front, the energy losses during backscatter sounding, the factors on which they depend, and so on, have been inadequate. In the proposed book these problems and a number of others are investigated in detail. In addition, an effort is also made to discover the possibilities of the method of backscatter sounding as a research tool and to determine its potential both energywise and with respect to precision. It is proposed that the problems selected for investigation correspond to this goal.

One of the basic physical phenomena on which the very existence of backscatter sounding depends is scattering of radio waves by inhomogeneities of the Earth's surface. Along with the basic solutions of a number of problems, the published papers in this field contain certain statements and conclusions, which are, at times, questionable. Some of them, which have direct bearing on the topic of the present paper, are investigated with the required degree of detail.

In this book, a study is made of only those problems which are required to master the technique and which are to a significant degree new. The greater part of the material in the book is based on the results of research performed by the author.



The first chapter contains an analysis of the effect of the Earth's magnetic field on the backscatter sounding signal, which is most complex in the relation between the skip distance and frequency. The appearance of two magneto-ionic components with different levels of field intensity and different delays can introduce ambiguity into the definition of the skip zone boundary.

During sounding usually several signals are observed the origin of which is different. In a number of cases, recognition of individual signals and determination of whether they belong to the F<sub>2</sub>, F<sub>1</sub>, E or E<sub>s</sub> layers is a complex problem. The basic problems of decoding oscillograms is the topic of the second chapter.

In sounding on a certain frequency, the distance to the skip zone boundary can be nonoptimal for organization of radio communications with a given subscriber. In this case, it is necessary to recalculate the sounding results to obtain the maximum usable frequency (MUF) corresponding to the new distance. This calculation can be performed on the basis of the given model of the ionosphere which insures the required accuracy of determining the distance to the skip zone boundary or the MUF. This class of problems is investigated in the third chapter.

The following chapters are devoted to the energy relations during backscatter sounding. The fourth and fifth chapters contain investigations of the problems of scattering of radio waves by the Earth's surface and the shaping of the backscatter sounding signal. Here, primary attention is given to scattering theory and determination of the intensity of the echo.

In the sixth chapter a study is made of backscatter sounding signal direction finding the accuracy of which, in the final analysis, determines the accuracy of the defined parameters on the test route. This problem is extremely important and possibly computers will be used to solve it. The mathematical aspect of the problem reduces to solving a so-called improper problem. However, the result of this solution still does not have at this time a form which is convenient for engineering practice.

In conclusion, the author expresses his deepest appreciation to Doctor of Technical Sciences K. M. Kosikov under whose guidance the backscatter sounding studies were made, and also the laboratory coworkers who participated in performing the experiments.

The reviewer, Candidate of Technical Sciences, L. A. Lobachevskiy, and responsible editor, Doctor N. I. Ivanov, were also of great assistance when working on the book. Their comments and advice undoubtedly resulted in improvement of the book.

Comments with regard to the book should be sent to Svyaz' Press (Moscow-Center, Gistotrudnyy Bul'var, d.2).

# INTRODUCTION

Short radio waves are usually propagated to long distances by successive reflections from the ionosphere and the Earth's surface. In following this discontinuous trajectory, the radio waves irradiate the Earth with different intensity, forming skip zones or zones of weak reception at certain points.

The Earth's surface, just as the ionosphere, is not an entirely even, ideally reflecting surface. Its electric properties vary randomly from point to point. Also, the heights of individual surface elements do not lie on a single horizontal plane, but are subject to a probability distribution law.

On reflection from a statistically uneven and electrically nonuniform surface, an incident plane wave acquires random phase variations at different points. After such reflection, the wave ceases to be plane, and individual local segments of the phase front which, as a rule, do not coincide with the direction of the primary specular reflection. So-called scattering of the waves on rough surfaces takes place.

A similar process also occurs during propagation of radio waves in the ionosphere where local variations in electron density lead to random variations in the coefficient of refraction and random distortions of the initially regular phase front. However, in the ionosphere the variations in the index of refraction are not so strong as to cause significant phase variations of the regular a small segment of the path, as occurs at the air-Earth boundary at random heights of individual segments of the Earth's surface. Therefore, the disturbances of the front on the path for one wavelength on reflection from the Earth are usually much greater than in the ionosphere, which results in more intense scattering of radio waves from the Earth's surface.

The scattering of short radio waves was already noted in the 1920's, and it has persistently attracted the attention of scientists since that time. This phenomenon is analogous to reverberation in acoustics and hydroacoustics. On discovery of it, the idea immediately occurred of the possibility of using the ionosphere and the Earth's surface. Short wave signals predominantly in the form of short pulses began to be specially studied with simultaneous

USSR

UDC 542.91:547.833.547.752:547.94

AKHREM, A. A., MOISEYENKOV, A. M., KRIVORUCHKO, V. A., CHERNOV, YU. G., and  
MALISHEVSKII, V. S., Institute of Organic Chemistry Imeni N. D. Zelinskii  
Acad. Sc. USSR, and Institute of Physical Organic Chemistry Acad. Sc. USSR

"Synthesis of Benzo [a]-and Indolo[a]quinolizines: a new Approach to the Total  
Synthesis of Some Isoquinoline and Indole Alkaloids"

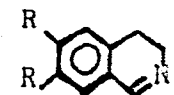
Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 10, Oct 72, p 2376

Abstract: Isomethines (I,II) react with acetyl- $\delta$ -lactone (IV) to yield a  
series of lactams (V-VII) which can be converted to corresponding pyranolactams  
(VIII-X), and dehydrated to pyridones (XI-XII). Compound (V) was converted in  
5 steps to tetrahydroprotoberberine (XIII).

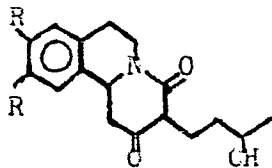
1/3

USSR

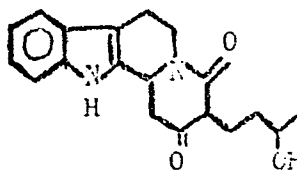
AKHREM, A. A., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 10, Oct 72, p 2376



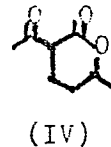
A(I) R=H  
(II) R=CMe



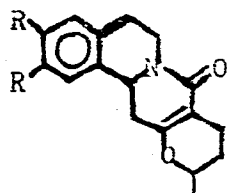
(V) R=H, m.p. 178-180°  
(VI) R=CMe, m.p. 183-185°



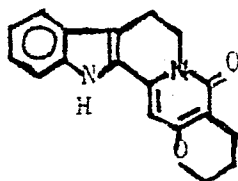
(VII) •MeOH  
m.p. 196-198°



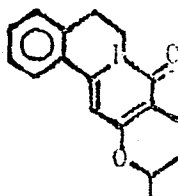
(IV)



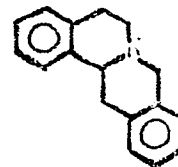
(VIII) R=H, m.p. 117-118°  
(IX) R=CMe, m.p. 143-144.5°  
2/3



(X), M.p.  
263-265°



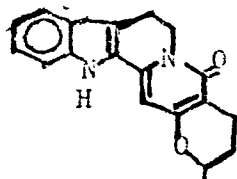
(XI), m.p.  
154-156°



(XIII)

USSR

AKHREM, A. A., et al, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 10, Oct 72, p 2376



(XII), m.p. 341-344°

3/3

1/2 020 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--EFFECT OF THE RATE OF ANTIMONY AND INDIUM IONS DISCHARGE ON THE  
PHASE COMPOSITION OF THE ALLOY -U-  
AUTHOR-(03)-BELITSKAYA, T.B., KOCHEGAROV, V.M., CHERNOV, YU.I.  
COUNTRY OF INFO--USSR  
SOURCE--ELEKTROKHIMIYA 1970, 6(2), 215-17  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--ANTIMONY ALLOY, INDIUM ALLOY, ION, INTERMETALLIC COMPOUND,  
COVALENT BONDING, ELECTRODEPOSITION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1988/0691 STEP NO--UR/0364/70/006/002/0215/0217  
CIRC ACCESSION NO--AP0105667  
UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--18SEP70  
CIRC ACCESSION NO--AP0105667  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CODEPOSITION OF SB AND IN WAS  
STUDIED FROM 4 GLYCEROL SOLNS. CONTG. A TOTAL METAL ION CONC. OF 0.4 M  
WITH IN (AS INCL SUB3) EQUALS 0.35, 0.3, 0.2, AND 0.1 M AND SB AS  
K(SBO)C SUB4 H SUB4 O SUB6.0.5 MINUS H SUB2 O AS THE REMAINDER AND KOH  
EQUALS 70 G-1. SOLNS. CONTG. HIGH CONCNS. OF SB GAVE DEPOSITS OF  
ESSENTIALLY PURE SB. BY LOWERING THE SB ION CONC. AND INCREASING THE  
CATHODIC POTENTIAL, THE INDIVIDUAL DISCHARGE CURRENTS WERE APPROX.  
EQUAL; THUS, THE DEPOSITS CAN BE MADE TO CONTAIN SB-IN ALLOYS. HOWEVER,  
CHANGING THE DEPOSITION RATE DID NOT PLAY AN IMPORTANT ROLE TOWARD THE  
FORMATION OF THE INTERMETALLIC INSB COMPD. WITH COVALENT BONDS.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--STRESS RELAXATION AND DISLOCATION MOBILITY IN LITHIUM FLUORIDE  
CRYSTALS DEFORMED AT 300 TO 4.2DEGREESK -U-  
AUTHOR--KLYAVIN, O.V., SMIRNOV, B.I., CHERNOV, YU.M.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TVERD. TELA 1970, 12(1) 286-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, PHYSICS  
TOPIC TAGS--CRYSTAL DISLOCATION, LITHIUM FLUORIDE, STRESS RELAXATION,  
PLASTIC DEFORMATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1988/0639 STEP NO--UR/0131/70/012/001/0286/0239  
CIRC ACCESSION NO--AP0105618  
UNCLASSIFIED



2/2 023

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105618

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STRESS RELAXATION CURVES WERE STUDIED FOR LOADED LIF CRYSTALS DEFORMED AT 300 TO 4.2 DEGREES K. SPECIMENS WERE DEFORMED IN COMPRESSION AT 300, 78, AND 4.2 DEGREES K USING A SPECIAL APP. AND OPTICAL CRYSTAT WHICH ALLOWS THE PROCESS OF PLASTIC FLOW OF THE CRYSTALS TO BE FOLLOWED BY THE POLARIZATION OPTICAL METHOD DIRECTLY AT LIQ. HE TEMPS. THE OPTICAL ELASTIC LIMIT  $\tau_{SUBS}$ , THE YIELD STRESS  $\tau_{SUBS}$ , AND THE MAGNITUDE OF STRESS  $\tau_{SUBM}$  AT WHICH THE RELAXATION CURVE WERE RECORDED. DEFORMATION TOOK PLACE ALONG (110)(110). IN THE PROCESS OF STRESS RELAXATION IN THE LOADED CRYSTAL, ELASTIC DEFORMATION OF THE SYSTEM (MACHINE PLUS SPECIMEN)  $\epsilon_{SUBE}$  DECREASES DUE TO THE PLASTIC DEFORMATION OF THE SPECIMEN  $\epsilon_{SUBP}$ ;  $\epsilon_{SUBP}$  EQUALS  $\epsilon_{SUBE} - \frac{M}{L}P$ , WHERE M IS THE HARDNESS OF THE SYSTEM, L IS THE SPECIMEN LENGTH, AND P IS THE LOAD. THE ACTIVATION VOL. WAS CALCD. FROM THE EXPTL. RELATION  $P(T)$ . THE CURVE OF THE VELOCITY OF THE DISLOCATION MOTION VS. STRESS IN LIF CRYSTALS BECOMES STEEPER WITH DECREASING TEMP. DOWN TO 4.2 DEGREES K. THE ACTIVATION VOL., WHICH DETS. THE MOTION OF THE DISLOCATIONS, DECREASES SHARPLY WITH INCREASING DEFORMING STRESS INDICATING A STRONG DEPENDENCE OF THE ACTIVATION ENERGY OF THE PROCESS OF DEFORMATION ON STRESS.

UNCLASSIFIED

USSR

CHERNOV, Yu. P.

"Optimal Control of the Process of Collection of Sugar Beets in the Beet-Sifting Section of the Raw-Material Zone of a Sugar Plant"

Nekotoryye Mat. Metody Optimiz. i Ikh Primeneniye v Nar. Kh-ve Kirgizii [Some Mathematical Methods of Optimization and Their Application to the National Economy of Kirgizia -- Collection of Works], Frunze, Ilim Press, 1973, pp 87-101 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V600).

Translation: The technical and economic content of the problem, its economic-mathematical model are presented. An algorithm is suggested for solution of the control problem presented, consisting of successive solution of a number of distribution problems. Several results of experimental-commercial testing for the Novotroitskiy Sugar Plant and its raw-material zone in 1971 are presented.

Author's veiw

1/1

= 55 -

USSR

UDC: 512.25/.26+519.3:330.115

CHERNOV, Yu. P.

"Some Problems of Parametric Fractional-Linear Programming"

V sb. Optimal'n. planirovaniye (Optimum Planning--collection of works),  
vyp. 16, Novosibirsk, 1970, pp 98-111 (from RZh-Kibernetika, No 9, Sep  
71, Abstract No 9V501)

[No abstract]

1/1

USSR

UDC: 512.25/.26+519.3:330.115

CHERNOV, Yu. P., LANGE, E. G.

"Transport Problem in Fractional Programming"

V sb. Optimal'n. planirovaniye (Optimum Programming--collection of works), vyp. 16, Novosibirsk, 1970, pp 112-131 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V485)

Translation: The following problem is considered. To find the minimum of

$$f(x) = \frac{\Phi(x)}{\Psi(x)} = \frac{\sum_{i=1}^m \sum_{j=1}^n \varphi_{ij}(x_{ij})}{\sum_{i=1}^m \sum_{j=1}^n \psi_{ij}(x_{ij})}$$

with limitations

$$\sum_{j=1}^n x_{ij} = a_i, \quad i=1, 2, \dots, m,$$

$$\sum_{i=1}^m x_{ij} = b_j, \quad j=1, 2, \dots, n,$$

$$\alpha_{ij} \leq x_{ij} \leq \beta_{ij}, \quad i=1, 2, \dots, m; j=1, 2, \dots, n, \quad (1)$$

1/2

USSR

CHERNOV, Yu. P., LANGE, E. G., Optimal'n. planirovaniye, vyp. 16, Novosibirsk, 1970, pp 112-131

where the functions  $\varphi_{ij}(x_{ij})$ ,  $\psi_{ij}(x_{ij})$  defined on segments  $[\alpha_{ij}, \beta_{ij}]$  are continuous and bounded for  $i=1, 2, \dots, m$ ;  $j=1, 2, \dots, n$ . The denominator of the functional  $\psi(x)$  is different from zero on the set  $R$  defined by limitations (1). Introduction.

2/2

USSR

UDC 669.187.2.083

GOTIN, V. N., ZAYTSEV, B. YE., SHCHERBAKOV, A. I., ZHITKOV, N. K., OKCROKOV, G. N., BOYARASHINOV, V. A., VOYNOVSKIY, YE. B., TOPILIN, V. V., SHALIMOV, AL. G., OSIPOVA, L. M., CHERNOV, YU. V., ROZANOVA, T. S., and LAKTIONOV, V. S.

"Influence of Wall Thickness of Crystallizer and Consumption of Cooling Water on Conditions of Formation of Ingot During Vacuum Arc Remelting"

Proizvodstvo Chernykh Metallov [Production of Ferrous Metals--Collection of Works], No 75, Metallurgiya Press, 1970, pp 178-180

Translation: In a vacuum arc furnace in a crystallizer (C) 160 mm in diameter with a current of 2.0-3.7 ka, the influence of wall thickness of C and temperature of cooling water on conditions of formation of ingot of complexly alloyed nickel-based alloys is studied. C with wall thicknesses of 30 and 18 mm were studied, the temperature on the outer surface of the C reaching 75°C in the first case, 105°C in the second. The temperature of the internal surface of the C was identical, 140-150°C. Neither a change in C thickness nor a change in water consumption from 11 to 22 m<sup>3</sup>/hr influenced the depth of the liquid metal bath, i.e., both repeated rolling of the C and reduced water consumption were permissible. 2 figures.

1/1

USSR

UDC:669.187.5

ZAYTSEV, B. Ye., GOTIN, V. N., SHCHERBAKOV, A. I., SERGYEV, A. B., ZHITKOV, N. K., OKOROKOV, G. N., BOYARSHINOV, V. A., TULIN, N. A., VOYNOVSKIY, Ye. V., TOPILIN, V. V., POZDEYEV, N. P., SHALIMOV, A. G., OSIPOVA, L. A., CHERNOV, Yu. V., and RAZANOV, T. S.

"Specifics of Vacuum Arc Remelting of Nickel-Based Alloys and Stainless Steels With Reverse Arc Polarity"

Proizvodstvo Chernykh Metallov [Production of Ferrous Metals--Collection of Works], No 75, Metallurgiya Press, 1970, pp 181-183

Translation: Results are presented from a study of vacuum arc remelting of nickel alloys in a crystallizer 380-480 mm in diameter with thermocouples calked in length and height. The rate of melting with reverse polarity is 20% higher with identical bath depth of liquid metal. This is a result of more intensive heat transfer from the walls of the crystallizer during melting with reverse polarity. The macrostructure, chemical composition N, O, H and mechanical properties of the metal produced by melting with forward and reverse polarity are identical. The ingot produced with reverse polarity had no corona. 2 figures; 1 table; 1 biblio. ref.

1/1

- 15 -

USSR

UDC 539.124:547.1'118:541.57:546.11

SHAGIDULLIN, R. R., CHERNOVA, A. V., MUKHAMETOV, F. S., RIZPOLOZHENSKIY, N. I., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov of the USSR Academy of Sciences

"Study of Electron Effects in a Series of 2-substituted oxaphospholanoles-3 by the H-Bond Method"

Moscow, Izvestiya Akademii Nauk SSSR- Seriya Khimicheskaya, No 11, 1972, pp 2585-2587

Abstract: The studies of the electron structure of phosphorus-containing compounds (R. R. Shagidullin, et al., Izv. AN SSSR. Ser. khim. 1123, 1966; Dokl. AN SSSR. No 173, 135, 1967; R. R. Shagidullin, et al., Izv. AN SSSR. Ser. khim. 183, 1971; R. R. Shagidullin, et al., Izv. AN SSSR. Ser. khim., 1168, 1971) are continued by applying the method introduced there to 2-substituted oxyphospholanoles-3. The proximity of the P atom causes a change in the acceptor capacity of the diethylamino group with respect to the proton. The variation in the acceptor capacity is connected with delocalization of the electron cloud of the substitution on the P atom. This phenomenon is explained by partial shifting of the unshared pair of electrodes of the nitrogen atom to the phosphorus.

1/1



USSR

UDC 541.124.2:546.18:547.1'118

CHERNOVA, A. V., and SHAGIDULLIN, R. R., Institute for Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Conjugation in Systems Containing a Phosphorus Atom"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No3, 1972, pp 722-724

Abstract: The Raman spectra and ultraviolet spectra of compounds with different numbers of phenyl and styryl groups at the phosphorus atom were studied to determine the role of phosphorus in altering the electronic structure. Spectral characteristics for ten phenyl and  $\beta$ -styryl compounds were summarized. From the UV data it was concluded that the preservation of the fine vibrational structure of the B-band and the additive increase in its intensity with increasing numbers of phenyl groups indicates the phosphorus exerts an isolating influence, that is, the phenyl rings do not form a single conjugated system. The Raman spectra also showed that the integrated intensity ( $I_R$ ) of the frequency  $\nu_{AR}$  was a linear function of the number of phenyl groups present.

1/1

USSR

UDC: 541.6 + 543.422.6 + 547.558.1/2

SHAGIDULLIN, R. R., and CHERNOVA, A. V., Institute of Organic and Physical Chemistry imeni A. M. Arbuzov, Acad. Sc. USSR

"Structure and UV-Spectra of Some Arylphosphines and -Arsines"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 71, pp 183-185

Abstract: UV spectra of aromatic phosphines usually show two bands in the range  $> 200$  m $\mu$ : an intense short-wave band around 220 m $\mu$  and a medium band at 250-270 m $\mu$ . The first band resembles the K-band of benzene, the second band had several interpretations but was believed to consist of three bands: K, E, and R. To check this out, studies were carried out on:  $C_6H_5CH:CHP(CC_2H_5)_2$  (I),  $C_6H_5CH:CHPCl_2$  (II),  $C_6H_5P(CC_2H_5)_2$  (III),  $C_6H_5PCl_2$  (IV),  $(C_6H_5)_2PCl$  (V),  $p-CH_3C_6H_4As(C_2H_5)_2$  (VI), and  $p-CH_3C_6H_4As(C_2H_5)_2$  (VII), yielding data which showed that the R-band ( $\pi \rightarrow \pi^*$  transition) are present in the spectra of arylphosphines and -arsines. For example, (IV) showed three sharp bands at 225, 245, and 275 m $\mu$ , the one at 245 being assigned to the R-band.

1/2

• USSR

SHAGIDULLIN, R. R., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 71, pp 183-185

Introduction of an electron-donor group into the p-position shifts two bands (K and R) in opposite directions, and the B band appears as shown by (VII). Oxidation of the product should lead to disappearance of the R-band, and indeed that's what was observed, as shown by the spectrum of anisyl-diethylarsine. It has been shown that the  $\rho$ - $\pi$  transition occurs in trivalent phosphorus and arsenic compounds in agreement with the observation that in the ground state their unshared electron pairs are localized at the heteroatoms and are not conjugated with the  $\pi$ -electron system.

2/2

- 62 -

USSR

UDC 620.193.1:669.295

(2)  
TOMASHOV, N. D., ANOSHKIN, N. F., MOROZNIKOVA, S. V., OGINSKAYA, YE. I.,  
RUSKOL, YU. S., and CHERNOVA, G. P., Institute of Physical Chemistry, Academy  
of Sciences USSR

"Investigation of the Effect of Palladium on the Engineering, Mechanical and  
Corrosion Properties of Titanium Alloys OT4 and VT14"

Moscow, Zashchita Metallov, Vol 9, No 6, 1973, pp 672-675

Abstract: The possibility of increasing the corrosion resistance of titanium  
alloys OT4 and VT14 by means of alloying with 0.2% Pd was studied. The alloys  
were produced in a vacuum-arc furnace with the palladium added in the form of  
powder. Structure of OT4 and OT4+0.2% Pd was the alpha-solid solution, and  
VT14 and VT14+0.2% Pd--fine grains of the alpha- and alpha"-phases inside a  
beta-matrix. Strength properties of the titanium alloys were improved somewhat  
with the addition of palladium while ductility was lowered. The add tion of  
2.0% Pd significantly lowered the oxidation tendency of the alloys at 600 and  
800°C, and especially at 1000°C. 3 figures, 4 tables, 6 bibliographic refer-  
ences.

1/1

USSR

UDC: 669.017:620.193.4(02)

TOMASHOV, N. D., CHERNOVA, G. P.

"Corrosion and Corrosion-Resistant Alloys"

Korroziya i Korrozionnostoykiye Splavy. [English version above], Moscow, Metallurgiya Press, 1973, 232 pp (Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 8I698K, by O. Pimenova).

Translation: This monograph presents the most important statements from the theory of corrosion processes. Particular attention is given to the most dangerous types of corrosion damage (pitting and intercrystalline corrosion) and the influence of mechanical factors on corrosion processes, as well as the basic principles of creation of corrosion-resistant alloys. The principle and possibilities of cathode modification of alloys in order to increase their corrosion resistance are described in detail. A brief review and primary characteristics are presented from the most important modern corrosion-resistant alloys, primarily those based on Fe.

1/1

- 11 -

# Corrosion

USSR

UDC 669.018.8+620.17

TOMASHOV, N. D., and CHERNOVA, G. P.

Korroziya i Korroziionnostoykiye Splavy (Corrosion and Corrosion-Resistant Alloys), Moscow, "Metallurgiya," 1973, 232 pp

Translation of Annotation: This book considers the theories of corrosion processes, localized corrosion (such as pitting, intercrystallite corrosion, fractures), and corrosion during the simultaneous action of mechanical loading (corrosion cracking, corrosion fatigue, and cavitation). Scientific principles are given for making metal alloys having high passivity and corrosion resistance. The properties of the major contemporary corrosion-resistant alloys used in construction are described.

This monograph is of interest to both scientific and engineering personnel, and builders dealing with problems of corrosion, anticorrosion protection, and the application of alloys to increase corrosion resistance. 76 Illustrations, 12 Tables, and 138 references.

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TOMASHOV, N. D., and CHERNOVA, G. P., Metallurgiya, 1973, 232 pp

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2/3

USSR

TOMASHEV, N. D. and CHERNOVA, G. P., Metallurgiya, 1973, 232 pp

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USSR

UDC 620.193.01

TOMASHOV, N. D., CHUKALOVSKAYA, T. V., ~~CHERNOVA, G. P.~~, PLAVNIK, G. M.,  
NAZAROVA, R. I., ZAKHAROV, A. P., and ~~SHESHENINA, Z. YE.~~, Academy of Sciences  
USSR, Institute of Physical Chemistry

"Structural Study of Surface Layer on Ti-Pd Alloys"

Moscow, Zashchita Metallov, Vol 8, No 3, May-Jun 72, pp 291-294

Abstract: The article describes results of an electron microscopic, electron diffraction, and X-ray study of the surface layer forming on Ti-Pd alloy (Ti-0.2 percent Pd and Ti-1 percent Pd) during corrosion in 40 percent  $H_2SO_4$  and 20 percent HCl at  $100^\circ$ . The electron microscopic study of the surface of Ti-Pd alloys after their corrosion confirms the supposition as to the accumulation of palladium on the surface in the form of very finely dispersed crystalline formations. After treatment of the surface with hot concentrated  $HNO_3$ , which dissolves Pd, the electron microphotographs show no particles. In the case of Ti-1 percent Pd palladium mainly forms very fine particles on the surface. The Pd accumulations on Ti-0.2 percent Pd alloy reveal a tendency towards the branched growth of primary crystallization centers.

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The results of the electron diffraction study of the surface of Ti-1 percent Pd alloy show that after corrosion in 20 percent HCl at 100° there are strong lines characteristic of Pd and very weak lines characteristic of TiO<sub>2</sub> and TiH<sub>2</sub>. After treatment of the alloy in HNO<sub>3</sub> the lines characteristic of Pd disappear, and only TiH<sub>2</sub> and TiO<sub>2</sub> are found on the surface. The relative intensity of the reflections characteristic of Pd increases with an increase in the corrosion time, while it decreases for TiH<sub>2</sub> and TiO<sub>2</sub>. After corrosion in 40 percent H<sub>2</sub>SO<sub>4</sub> at 100° reflections characteristic of Pd, TiH<sub>2</sub>, and TiO<sub>2</sub> are observed. However, the intensity of the Pd-characteristic lines is considerably weaker than after corrosion in 20 percent HCl at 100°, and they are of a diffuse character, while the intensity of the reflections characteristic of TiH<sub>2</sub> and TiO<sub>2</sub> is stronger.

X-ray analysis of the powdered surface layer that forms on Ti-1 percent Pd alloy shows that after corrosion in 20 percent HCl at 100° the alloy

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preferentially contains metallic palladium. After corrosion of the alloy in 40 percent  $H_2SO_4$  at  $100^\circ$ , along with the strongest Pd lines, considerably weaker lines characteristic of  $Ti_2N$  are observed.

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Titanium

USSR

UDC 620.193.01

TOMASHOV, N. D., CHERNOVA, G. P., and MANSKIY, YE. G., Institute of Physical Chemistry, Academy of Sciences USSR

"The Electrochemical Behavior of Metal Ceramic Titanium"

Moscow, Zashchita Metallov, Vol 10, No 1, Jan-Feb 74, pp 22-27

Abstract: The electrochemical behavior of specimens of titanium produced by powder metallurgy methods in 20% HCl is studied. The cathodic and anodic behavior of specimens and the change in potential of inner layers upon polarization of the surface are studied. The true surface of the specimens is defined by measurement of the capacitance of the binary layer. Cylindrical specimens 22 mm in diameter and 6 mm high were pressed from electrochemical titanium powder with particle sizes of 100-180  $\mu$  with microdendritic structure at pressures of 12-60 t/cm<sup>2</sup> with subsequent sintering in a vacuum at 1100°. It is established that the decrease in active surface is more intensive than the decrease in porosity, apparently related to the decrease in depth of penetration

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TOMASHOV, N. D., et al., Zashchita Metallov, Vol 10, No 1, Jan/Feb 74,  
pp 22-27

of the electrochemical process for specimens with lower porosity. The primary difference in electrochemical behavior of an electrode of porous titanium from that of compact titanium electrodes is the possibility of occurrence of the process not only on the surface, but also in the volume of the specimen.

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USSR

UDC 620.193.013:669.295

TOMASHOV, N. D., CHUKALOVSKAYA, T. V., ~~CHERNOVA, G. P.~~, BUDBERG, P. B., and GAVZE, A. L., Institute of Physical Chemistry, Academy of Sciences USSR

"Study of the Corrosion Resistance of Alloys of the Titanium-Tantalum--Niobium System"

Moscow, Zashchita metallov, Vol 8, No 1, Jan-Feb 72, pp 3-7

Abstract: Tantalum effectively raises the corrosion resistance of titanium-base alloys; its use, however, is limited due to cost factors and scarcity. The study of the ternary Ti-Ta-Nb system is essential for determining the feasibility of partial replacement of tantalum with the more readily available niobium. The corrosion and electrochemical behavior of the alloys was studied as annealed and quenched in a 5% HCl solution at 100°C. Analysis of the phase transformation and microstructure of the alloy indicates an isothermal section at 600°C which is characterized by a narrow region of  $\alpha$ -solid solution, a wide two-phase ( $\alpha+\beta$ ) region, and a wide region of  $\alpha$ -solid solution. At about the same average compositions, Ti-Ta-Nb alloys with single-phase structures exhibit corrosion resistance values which are one or two orders of magnitude higher than those shown by two-phase alloys. The higher resistance is characteristic of annealed Ti-Ta-Nb alloys with  
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TOMASHOV, N. D., et al., Zashchita metallov, Vol 8, No 1, Jan-Feb 72, pp 3-7  
a more stable  $\beta$ -phase. Alloying of Ti with Nb and, specifically, with Ta results in a considerable increase in corrosion resistance, the total content of alloying elements, ranging from 20-40% for annealed and 10% for quenched alloys. The study demonstrates the feasibility of replacing tantalum with niobium without reducing markedly the corrosion resistance of the above alloys. (3 illustrations, 1 table, 9 bibliographic references).

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TOMASHOV, N. D., et al., Zashchita Metallov, Vol 7, No 4, Jul-Aug 71, pp 387-391

have a homogeneous structure of a  $\beta$ -solid solution or a heterogeneous structure  $\alpha + \beta + \gamma$ . The investigation results are discussed by reference to the shown microstructure and diagrams of polythermal cuts of the alloys by different correlation of their components and effects of the alloying components on the corrosion rate. It was found that the stability region of the  $\beta$ -phase on the state diagram increases and the beginning eutectoid transformation  $\beta \rightarrow \alpha + \gamma$  shifts into the region of higher contents of alloying elements and lower temperatures by increasing the relative content of Ta to Cr relations of 1:3, 1:1, and 3:1. The corrosion rate of alloys with homogeneous structure is lower than that of alloys with heterogeneous structure by 2-10 times and more. The Ti - Ta - Cr alloys with Ta:Cr=3:1 and the Ti - Ta alloys with a Ta-content of 20 % and higher are corrosion-resistant in 5 % HCl at 100 deg. The Cr-alloying of Ti decreases its corrosion properties in the HCl-solution and the corrosion rate increases with increasing Cr-content, particularly for alloys with heterogeneous structure. Four illustr., eight biblio. refs.

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USSR

UDC 620.193.01

TOMASHOV, N. D., CHERNOVA, G. P., and MATVEYEVA, T. V., Institute of Physical Chemistry, Academy of Sciences, USSR

"Effect of the Volume of the Solution and the Presence of Oxygen and Titanyl Ions in It on the Corrosion of Titanium-Palladium and Titanium-Ruthenium Alloys"

Moscow, Zashchita Metallov, Vol 6, No 2, Mar-Apr 70, pp 145-150

Abstract: The corrosion of Ti-Pd and Ti-Ru alloys may increase with continuous regeneration of the corrosion solution (boiling 5% HCl), as well as in an inert atmosphere (nitrogen) over the solution (5--20% HCl, 10--40% H<sub>2</sub>SO<sub>4</sub>, 25°C). This is attributed to the fact that the process of discharge of hydrogen ions may be inadequate to shift the alloy's potential to the passivation region. The addition of oxidizers (O<sub>2</sub>, TiO<sup>2+</sup>) will result in self-passivation of the alloy. Titanylions, though they have a redox-potential less positive than that of oxygen, are more soluble and, on accumulation in the solution, serve as transfer agents of the oxidizing functions of dissolved oxygen from the volume of the solution to the corroding surface. As the solution volume-to-specimen surface ratio is increased, or as the solution is periodically replaced, the corrosion rate of titanium and titanium-palladium alloys in acid (HCl) may considerably increase. This is ascribed not to a reduced concentration of palladium ions in solution, but to a lower concentration of titanyl ions, the latter being the additional oxidizer.

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UDC 669.295.5'28'234:620.193.41

CHERNOVA, G. P., KOSHECHKIN, K. I., and TOMASHOV, N. D.

"Corrosive and Electrochemical Behavior of Ti-Mo-Pd Alloys in Solutions of Hydrochloric Acid at 100° C"

V sb. Korroziya i zashchita met. (Metal Corrosion and Protection -- Collection of Works), Moscow, "Nauka," 1970, pp 40-43 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 I831 by the authors)

Translation: A study was made of the corrosion resistance of Ti-Mo alloys (5, 10, 27%) and of the same alloys supplementally doped with 0.2 and 0.5% Pd in 3-20% HCl at 100°. Alloys of Ti with 5 and 10% Mo and 0.2% Pd in 3-10% HCl at 100° approach Ti-27% Mo alloys with regard to corrosion resistance. On the addition of  $\text{Fe}^{3+}$  or  $\text{Cu}^{2+}$  ions to 20% HCl, Ti-Mo and Ti-Mo-Pd alloys have a corrosion rate > 10 mm/year. This is due to the shift of the corrosion potentials of these alloys in the Mo transpassivation region. One illustration. One table. Bibliography of 10 titles.

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USSR

UDC 669.295.5'28'26.018.8:669.234

TOMASHOV, N. D., IGNATOV, N. N., and CHERNOVA, G. P.

"Investigation of the Corrosion Resistance of Ti-Mo-Cr-Pd Alloys"

V sb. Korroziya i zashchita met. (Metal Corrosion and Protection -- Collection of Works), Moscow, "Nauka," 1970, pp 44-49 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 I832 by the authors)

Translation: A study was made of the corrosion resistance of Ti-Mo-Cr alloys (5-30% Mo and 1-10% Cr) and certain ternary alloys supplementarily doped with 0.2 and 0.5% Pd in solutions of  $H_2SO_4$  (5-40%) and HCl (5-25%) at 20, 60, and 100°. Supplementary doping of Ti-Mo alloys with chromium lessens the corrosion rate of the alloys in proportion to the increase of Cr concentration. The doping of Ti-Mo-Cr alloys with palladium raises their corrosion resistance 10-100 times. Two illustrations. Three tables. Bibliography of 11 titles.

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1/2 030 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--EFFECT OF THE VOLUME OF A SOLUTION AND THE PRESENCE OF OXYGEN AND  
TITANYL IONS IN IT ON THE CORROSION OF TITANIUM PALLADIUM AND TITANIUM  
AUTHOR--(03)-TOMASHOV, N.D., CHERNOVA, G.P., MATVEYEVA, I.V.

COUNTRY OF INFO--USSR

SOURCE--ZASHCH. METAL. 1970, 6(2), 145-50

DATE PUBLISHED-----70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATERIALS

TOPIC TAGS--TITANIUM ALLOY, RUTHENIUM ALLOY, PALLADIUM ALLOY, METAL  
CORROSION, OXYGEN, ION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1996/1912

STEP NO--UR/0365/70/006/002/0145/0150

CIRC ACCESSION NO--AP0118874

UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0118374

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A STUDY WAS MADE ON THE EFFECT OF THE SOLN. VOL. TO SURFACE AREA RATIO, CHANGE OF SOLN., ATM. COMPN., AND TI PRIME4POSITIVE ADDN. ON THE CORROSION OF TI-PD AND TI-RU ALLOYS. IN H SUB2 SO SUB4 AND HCL SOLNS. AT ROOM TEMP., TI-0.2PERCENT PD AND TI-(0.2-0.5PERCENT) RU ALLOYS IN AN ATM OF N MAINTAIN THE POTENTIAL OF THE ACTIVE PASSIVE STATE AND CORRODE AT A HIGHER RATE THAN IN AN AIR ATM OR IN THE PRESENCE OF TI IONS IN THE SOLN., THE TI IONS PROMOTING SELF PASSIVATION. CONSEQUENTLY EVEN IN THE PRESENCE OF CATHODIC ADDITIVES THE PROCESS OF H ION DISCHARGE CAN IN SOME CASES BE INSUFFICIENT TO SHIFT THE ALLOY POTENTIAL INTO THE REGION OF TI PASSIVATION. ONLY THE INTRODUCTION OF ADDNL. OXIDIZERS (O SUB2, TIO PRIME2POSITIVE) LEADS TO SELF PASSIVATION OF THE ALLOYS. ALTHOUGH TI IONS HAVE A LESS POS. REDOX POTENTIAL THAN O, THEY ARE MORE SOL. AND WHEN THEY ACCUMULATE IN THE SOLN., THEY ACT AS ACCUMULATORS AND CARRIERS OF THE OXIDIZING FUNCTIONS OF DISSOLVED OXYGEN FROM THE BULK OF THE SOLN. TO THE CORRODING SURFACE. ON INCREASING THE RATIO OF SOLN. VOL. TO THE SURFACE AREA OF THE SPECIMEN OR ON PERIODICALLY CHANGING THE SOLN., THE CORROSION RATE OF TI AND ITS ALLOYS WITH PD CAN INCREASE NOTABLY, DUE NOT TO THE DECREASE IN THE PD ION CONCN. IN SOLN. BUT TO THE TITANYL ION CONCN. WHICH ARE SUPPLEMENTARY OXIDIZERS. FACILITY: INST. FIZ. KHIM., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC: 669.018.8

TOMASHOV, N. D., CHERNOVA, G. P., and VOLKOV, L. N., Institute of Physical Chemistry, Academy of Sciences USSR

"Effect of Palladium on the Corrosion and Electrochemical Behavior of OKh25N6T Steel"

Moscow, Zashchita Metallov, Vol. 6, no. 4, Jul-Aug 70, pp 425-427

Abstract: This study concerns the effect of palladium on the corrosion of OKh25N6T steel in 10 and 20% sulfuric acid at 100°C and free access of air. The study shows that in 20% sulfuric acid at 100°C the corrosion rate of OKh25N6T steel alloyed with palladium is lower by one order of magnitude. However, since the corrosion potentials of steels with palladium fail to attain stable passivity, the steels continue to dissolve at a considerable rate. In 10% sulfuric acid at 100°C, a steel with 0.5 palladium after a period of active dissolution is in a completely passive state and the corrosion rate is four orders of magnitude lower than in passive-active state. The obtained data suggest that the passivation of chromium steels alloyed with nickel (6%) and palladium (0.1--0.5%) occurs in two stages. The first one

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TOMASHOV, N. D., et al, Zashchita Metallov, Vol. 6, no. 4, Jul-Aug 70, pp 425-427

(at a potential of  $-0.22$  v) is controlled by the buildup of nickel on the surface of the alloy, while the second ( $-0.12$  v) -- is controlled by the buildup of palladium. The nickel buildup stage is completed by the partial nickel passivation to its stationary potential ( $-0.12$  v); the palladium buildup stage results in a more thorough passivation to potential of  $+0.01$  v which corresponds to the cathodic process of hydrogen liberation on palladium. Steels with 0.5 palladium affected by oxygen depolarization (with free access of air) may even exhibit a more thorough passivation up to potentials of the order of  $0.5$  v followed by a steep rise in corrosion resistance.

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USSR

UDC: 621.385.6:621.3.035.44

KOGEN-DALIN, V. V., KUZNETSOV, E. V., CHERNOVA, I. M., SHATUNOVSKIY, V. I.

"Electrolytic Bath Simulation of Complex Magnetic Systems With Permanent Magnets for Microwave Devices"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology, Scientific and Technical Collection. SHF Electronics), 1971, vyp. 2, pp 43-52 (from RZh-Elektronika i yeye Primeneniye, No 6, Jun 71, Abstract No 6A45)

Translation: The possibility of calculating complex magnetic systems by the method of simulation in an electrolytic bath is demonstrated by a shunt-controlled magnetic system of the "bracket" type. In the calculation on the model, account is taken of the nonlinear properties of the magnetic materials of the permanent magnet and the magnetically soft materials of the armature and shunt. Electric analogs with nonlinear properties are made up from a grid of linear controllable two-terminal networks which are tuned by a special procedure. Recommendations are given on making analog circuits of various sections of complex magnetic systems. A selected example is used to illustrate the possibilities of calculating the systems by simulation in a bath. Bibliography of five titles. Resumé.

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1/2 005 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--WATER REGIME OF THE THERMAL NETWORK OF THE MOSCOW REGIONAL POWER  
SYSTEM DIRECTORATE -U-  
AUTHOR--CHERNOVA, L.A.  
COUNTRY OF INFO--USSR  
SOURCE--TEPLOENERGETIKA 1970, 17(5), 54-6  
DATE PUBLISHED-----70  
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--HEATING ENGINEERING, WATER ANALYSIS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3005/0388 STEP NO--UR/0096/70/017/005/0054/0056  
CIRC ACCESSION NO--AP0132617

UNCLASSIFIED

2/2 005

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0132617

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REVIEW WITH NO REFS. OF THE  
MOSCOW CENTRAL HOT WATER HEATING SYSTEM. THE QUALITY OF WATER  
(HARDNESS, ALKAL., O, AND FE CONTENTS) AVAILABLE AND THEIR TREATMENT TO  
MINIMIZE BOILER AND DISTRIBUTION LINE CORROSION AND DEPOSITS FORMATION  
IS DISCUSSED.

UNCLASSIFIED

USSR

UDC 632.95

SIMONOV, V. D., CHERNOVA, L. N., YASHMAN, YA. B.

"Method of Obtaining Perchlorated Cyclic Hydroxyketonitriles"

USSR Author's Certificate No 301323, filed 15 Dec 69, published 9 Jul 71 (from RZh-Khimiya, No 6 (II), Jun 72, Abstract No 6N547)

Translation: The biologically active compound -- 2,3-dichloro-5-cyano-2-cyclopenten-1-ol-4-one (I) -- is obtained by the reaction of perchlorated cyclopentenedione containing a dichloromethylene group with excess gaseous  $\text{NH}_3$  in an organic solvent. The gaseous  $\text{NH}_3$  was passed with mixing for 30 minutes into a solution of 2.46 grams of 2,3-dichloro-5-(dichloromethylene)-2-cyclopentene-1,4-dione in 70 ml of  $\text{C}_6\text{H}_6$ . The precipitate was filtered, washed with  $\text{C}_6\text{H}_6$  and dried; then it was dissolved in 15 ml of 10% HCl (acid) and extracted with ether. The ether extracts were dried over  $\text{CaCl}_2$ , evaporated and 2.45 grams of I was isolated, melting point of  $53-6^\circ$  (after recrystallization from the  $\text{CHCl}_3$ /ether, melting point of  $56.5-58^\circ$ ), and a molecular weight of 500-520 (titration with alkali and cryoscopy in dioxane). On dehydration, the I-enol converts to the ketone form with a melting point of  $118-120^\circ$ . I is well soluble in water (pH 1.5). It forms salts with  $\text{NH}_3$ ,  $\text{Et}_3\text{N}$  and metals.

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